

Ketamine use for sedation

Background

Ketamine, a derivative of phencyclidine, is a widely used short acting anaesthetic. At subanaesthetic doses it has analgesic effects, along with sedative and amnesic properties. Its main use in ED is for procedural or conscious sedation rather than general anaesthesia. It is also a useful drug for use in the pre-hospital setting.

Compared to other anaesthetic agents it tends to have less effect on the airway reflexes with preservation of pharyngeal tone, coughing and swallowing reflexes. Other advantages are that it is very quick acting (<1min), with less respiratory depression and a short recovery time (typically 30minutes) especially compared to the traditional morphine/midazolam technique (when used as a single agent). The cardiovascular system also less compromised than with other induction agents.

Potential Indications

- Manipulation of dislocations and fractures
- Removal of penetrating objects.
- Chest drain insertion.
- Pre-hospital extrication.

Contraindications

- Hypertension (Systolic BP > 150mmHg)
- Porphyria
- History of hallucinations
- Pregnancy

Precautions

- Head injury. Ketamine is relatively contraindicated as it can cause a further rise in intracranial pressure from increased cerebral blood flow. Avoid if possible in situations where there is suspicion or indication of intracranial pathology e.g. loss of consciousness, decreased GCS.
- Patients with high alcohol intake. Patients in early or established alcohol withdrawal seem to be more likely to have a hallucinogenic reaction. It may be that additional benzodiazepine has to be used to treat the alcohol withdrawal but at present ketamine should be avoided in these patients.

- Upper respiratory or pulmonary infections (increased risk of laryngospasm)
- Ocular Injury or Raised Intraocular pressure (as for head injury).

Warnings

- Monitor vital signs, respiration & cardiac function.
- Contains preservative.
- Incompatible with barbiturates - do not use in same syringe.

Interactions

INCREASED HYPOTENSIVE EFFECT

- | | |
|---------------------------------|-----------------------------|
| • ACE INHIBITORS WITH THIAZIDES | • PHENOTHIAZINES |
| • ANTIHYPERTENSIVES | • PIMOZIDE |
| • BETA BLOCKERS AND THIAZIDES | • QUETIAPINE |
| • CLOZAPINE | • REMOXIPRIDE |
| • FLUSPIRILINE | • RISPERIDONE |
| • LOXAPINE | • SOTALOL |
| • MAOIS | • TRICYCLIC ANTIDEPRESSANTS |
| • OLANZAPINE | • ZOTEPINE |

INCREASED RISK OF CNS SIDE EFFECTS

- MEMANTINE

INCREASED RISK OF CONVULSIONS

- THEOPHYLLINE

Side Effects

- | | |
|-----------------------|----------------------------|
| • Laryngospasm | • Rash |
| • Arrhythmias | • Pain on injection |
| • Anorexia | • Nystagmus |
| • Hypotension | • Erythema |
| • Bradycardia | • Diplopia |
| • Apnoea | • Salivation changes |
| • Nausea | • Hypertension (transient) |
| • Vomiting | • Hypertonicity |
| • Confusion | |

Laryngospasm may rarely occur. 'Mild' laryngospasm secondary to hypersalivation usually responds to head repositioning and suctioning to relieve the secretions.

The operator should however be ready to deal with more severe laryngospasm by Bag-Valve mask ventilation with PEEP, while keeping formal RSI on reserve.

Packs

Ketamine is held in the drug cupboard in the Resuscitation Room. It is available in two different formulations, with the 10mg/ml formulation used for intravenous administration and the 100mg/ml formulation for intramuscular administration.

Ensure the correct formulation is used.

Typically the IV 10mg/ml formulation is used – drawing up a full 1mg/kg dose e.g. 70kg patient = 7mls.

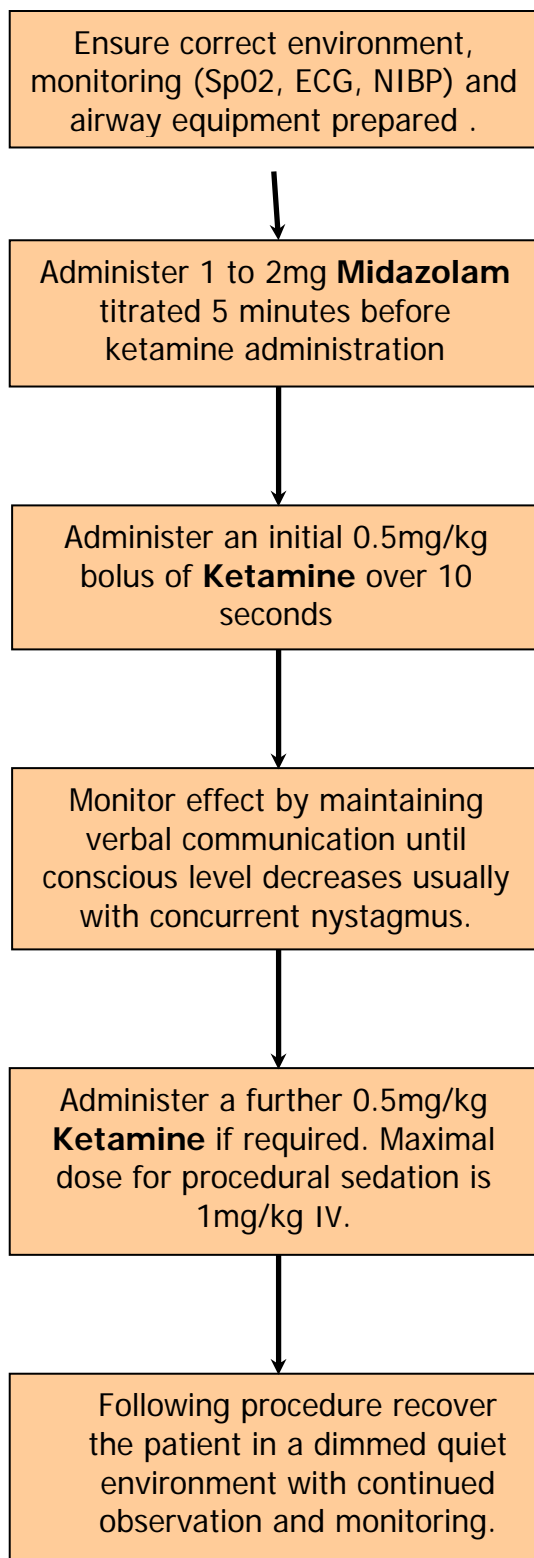
Dosage

| | IV | IM |
|----------------------------|-----------------------|----------------|
| Analgesia | 0.5 <i>mg/kg</i> | 1 <i>mg/kg</i> |
| Procedural Sedation | 1 <i>mg/kg</i> | 2 <i>mg/kg</i> |
| Induction of anaesthesia | 2 <i>mg/kg</i> | 4 <i>mg/kg</i> |

Use of procedure

Ketamine should only be used by middle grade doctors with previous anaesthetic training and only after instruction in the technique. It should only be used when an ED Consultant is present in the department.

Procedure



Notes

One member of the care team must have a defined responsibility for patient observation and record keeping.

A short acting benzodiazepine is used to cover emergence phenomena and It is helpful to pre-warn relatives and the patient of emergence phenomena to minimise its impact should it occur.

This 'half and half' dosing of ketamine is used as drug combinations may produce a synergistic action, particularly with opiate analgesia and benzodiazepines, and should be used with particular care.